LIMITED GEOTECHNICAL EVALUATION

COUNTY VISTA DRIVE COMMERCIAL BUILDING
21801 COUNTY VISTA DRIVE
LIBERTY LAKE, WASHINGTON

ALLWEST PROJECT NO. 216-266G

AUGUST 31, 2016

ALLWEST
Testing & Engineering

ALLWEST Testing & Engineering

Construction Materials Testing & Special Inspection
Geotechnical Engineering
Environmental Consulting
Non-Destructive Testing
Welder Certification

August 31, 2016
Project No. 216-266G

Mr. Todd Sternfeld
Kunpeng, LLC.
C/O Baker Construction
Attn: Mr. Reed Caudle
2711 East Sprague Avenue
Spokane, Washington 99202

RE: Limited Geotechnical Evaluation
Country Vista Commercial Building
21801 East Country Vista Drive
Liberty Lake, Washington

Mr. Sternfeld and Mr. Caudle,

ALLWEST Testing & Engineering, LLC. (ALLWEST) has completed the authorized limited geotechnical evaluation for the proposed project at the above-referenced site in Liberty Lake, Washington. The attached report presents the results of the field evaluation, laboratory testing, and our recommendations to assist the design and construction of the proposed project.

We appreciate the opportunity to work with you on this project. If you have any questions, or need additional information, please do not hesitate to call us at (509) 534-4411.

Sincerely,
ALLWEST Testing & Engineering, LLC

Cole W. Warrick, P.G.
Project Geologist

Andy Eliason

Andy J. Eliason, P.E.
Spokane Area Manager

Attachment: Limited Geotechnical Evaluation Report

3005 N. Industrial Lane, 5th Street, Spokane Valley, WA 99216
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21801 East Country Vista Drive
Liberty Lake, Washington

LIMITED GEOTECHNICAL EVALUATION
COUNTRY VISTA DRIVE COMMERCIAL BUILDING
21801 EAST COUNTRY VISTA DRIVE
LIBERTY LAKE, WASHINGTON

ALLWEST Testing & Engineering, LLC (ALLWEST) has completed the authorized limited geotechnical evaluation for the proposed Country Vista Drive Commercial Building to be located at 21801 East Country Vista Drive in Liberty Lake, Washington. The general location of the project is shown on the Vicinity Map, Figure A-1, in Appendix A of this report. The purpose of the limited evaluation was to assess the subsurface soil conditions at the subject property with respect to the proposed construction. This report details the results of the field evaluation and laboratory testing and presents our recommendations to assist the design and construction of the proposed project.

1.0 SCOPE OF SERVICES

To complete our services, we accomplished the following:

1) Reviewed the USDA Natural Resources Conservation Service (Soil Conservation Service) and Washington Geological Survey geologic mapping information for the project site area.

2) Completed a site reconnaissance by walking the property and observing exposed surface conditions including soil, vegetation, erosion, and drainage.

3) Performed a field evaluation by observing the excavation of five (5) exploratory test pits within the proposed construction areas. We obtained samples of the soils encountered in the test pits and retained them for laboratory testing. The soils were visually described and classified and the subsurface profiles were logged.

4) Performed laboratory tests on select soil samples to assess some of the soil engineering characteristics.

5) Reviewed the results of the field evaluation and laboratory testing with respect to the proposed construction.

6) Performed engineering analyses and prepared recommendations to assist project planning, design and construction.

7) Prepared this report.

Our services were provided in general accordance with our June 22, 2016 proposal.

2.0 PROJECT DESCRIPTION

We understand the proposed project consists of constructing a new multi-tenant commercial building. The commercial building will likely be constructed with a reinforced concrete foundation and a concrete on-grade floor slab. We anticipate the wall construction will be masonry or structural steel and the roof will consist of open web steel joists. We further anticipate parking stalls, drive areas, landscaping, and stormwater management facilities will occupy the remainder of the site. At the time of this report, specific design criteria are not known. For our purposes, we have assumed wall loads will be on the order of 2 to 6 kips per linear foot and column loads, if any, will be less than 50 kips. We have further assumed traffic loads in the parking and drive areas will consist primarily of light automobiles and maintenance trucks with axle loads of 10 tons or less. If actual construction materials and loads vary from our assumptions, ALLWEST should be notified once details of the proposed building construction become available.

3.0 EVALUATION PROCEDURES

To complete this evaluation, we reviewed soil and geologic literature for the project area. We conducted a field evaluation of the property including a site reconnaissance to assist in planning the field evaluation and provide a general overview of the property. Information obtained from the field evaluation, review of the referenced documents, laboratory testing and engineering analysis were utilized to develop recommendations for the geotechnical aspects of the project.

4.0 SITE CONDITIONS

At the time of our field exploration, the ground surface was covered with native grasses and weeds. We did not observe rock outcrops or standing water during our site evaluation. The site is bounded by a parking lot for the Home Depot Store to the north, Country Vista Drive to the south, a stormwater swale to the west, and North Whitman Lane to the east.

4.1 General Soil Conditions

The USDA Soil Conservation Service (SCS) (currently the USDA Natural Resources Conservation Service - NRCS) has mapped the soil on the property as Urban Land-Opportunity complex (see Appendix A, Figure A-2). The Urban Land-Opportunity soil is described as well draining material that formed in sandy and gravelly glaciofluvial deposits with minor amounts of volcanic ash and loess in the upper part. The soils encountered in the test pits are generally consistent with the SCS mapping.

4.2 Hydrogeologic Conditions

Site-specific groundwater reports and well logs indicate the water level in the vicinity of the subject property approximately fifty (50) to eighty (80) feet below the ground surface. Groundwater was not observed in the test pits during the field exploration.

Changes in precipitation, construction or other factors may impact the depth to groundwater on the property. Fluctuations in the groundwater level should be expected.

5.0 SUBSURFACE CONDITIONS

Five (5) test pits were observed at the site at the approximate locations shown on the Test Pit Location Map, Figure A-3, in Appendix A of this report. The test pit locations were measured from features shown on the site plan provided. The test pits were excavated with a rubber tire backhoe under subcontract to ALLWEST. The soil conditions observed in the test pits were visually described and classified in general accordance with ASTM D 2487 and D 2488 and the subsurface profiles were logged. Representative soil samples were obtained from the test pits.

5.1 Subsurface Soil Conditions

The subsurface soil profile observed in the test pits was relatively consistent and consisted of up to approximately twelve (12) inches of silty sand topsoil with organics and gravel overlying sand and gravel with variable silt and cobble content to the termination depths of the test pits. The fines content (percent by weight passing a No. 200 sieve) decreased with depth.

Detailed descriptions of the soil observed in the test pits are presented on the Logs of Test Pits in Appendix B of this report. The descriptive soil terms used on the test pit logs and in this report can be referenced by the Unified Soil Classification System (USCS). A copy of the USCS is included in Appendix B. The subsurface conditions may vary between exploration locations. Such changes in conditions would not be apparent until construction. **If the subsurface conditions do change from those observed in the test pits, the construction timing, plans, and costs may change. Test pits were loosely backfilled following our exploration. The test pits should be excavated and backfilled to 95 percent of modified Proctor prior to construction.**

5.2 Bedrock

Bedrock was not encountered in the test pits.

5.3 Groundwater Conditions

Groundwater was not observed in the test pits at the time of our exploration. Changes in precipitation, construction or other factors may impact the depth to groundwater on the property. Fluctuations in the groundwater level should be expected.

6.0 LABORATORY TESTING

Laboratory testing was performed to supplement field classifications and to assess some of the soil engineering parameters. The laboratory tests conducted included particle size distribution tests (ASTM D 6913). The laboratory test results are summarized in Appendix C. The laboratory testing was performed by ALLWEST.

7.0 SLOPE STABILITY ANALYSIS

Slope stability concerns were not noted for the project site.

8.0 CONCLUSIONS AND RECOMMENDATIONS

It is our opinion the site is suitable for the proposed construction provided the recommendations in this report are followed and the associated risks are acceptable to the owner.

The following recommendations are presented to assist the planning and design of the proposed building, pavement and stormwater management structures. The recommendations are based on our understanding of the proposed construction, the conditions observed in the test pits, laboratory test results and engineering analysis. **If the scope of the construction changes, or if conditions are encountered during construction that are different than those described in this report, we should be notified so we can review our recommendations and provide revisions if necessary**.

8.1 Site Preparation

Building

Prior to conducting site grading, vegetation, deleterious material, disturbed soil, soil containing significant amounts of roots and organics and any uncontrolled fill should be removed its entire depth below foundations, slabs, pavements, and flatwork. Based on the subsurface conditions observed in the test pits, we anticipate this may require the removal of up to approximately twelve (12) inches of topsoil throughout the site.

Prior to placing structural fill, the exposed subgrade should be scarified to a minimum depth of eight (8) inches; then properly moisture conditioned and compacted to at least 95 percent of the modified Proctor maximum dry density as established by ASTM D 1557. Compaction of the subgrade may be reduced to proof rolling at the discretion of the geotechnical engineer based on conditions at the time of construction. If the subgrade is observed to significantly deflect, it should be over-excavated to firm, non-yielding soil and replaced with properly compacted fill or stabilized as recommended in the Subgrade Stabilization section of this report.

Pavement Areas

Subsequent to grubbing and removal of unsuitable soil, the exposed subgrade should be scarified to a depth of eight (8) inches; properly moisture conditioned and compacted to at least 95 percent of the modified Proctor maximum dry density as established by ASTM D 1557. Compaction of the subgrade may be reduced to proof rolling at the discretion of the geotechnical engineer based on conditions. If the subgrade is observed to significantly deflect, it should be over-excavated to firm, non-yielding soil and replaced with properly compacted fill or stabilized as recommended in the Subgrade Stabilization section of this report.

Utilities

Support soil for underground utilities will likely consist of native, poorly to well graded gravel. It is our opinion the native, poorly to well graded gravel should generally provide adequate support for utilities. It is our opinion the native poorly to well graded gravel and the uppermost, inorganic silty sand and silty gravel soils may be used as backfill for utilities. Topsoil should not be used to backfill utilities.

8.2 Subgrade Stabilization

If the subgrade is observed to pump or deflect significantly during grading, it should be stabilized prior to placement of fill. The subgrade may be stabilized using either fractured, angular cobble or with geosynthetic reinforcement in conjunction with imported structural fill. The required thicknesses of crushed cobble or structural fill (used in conjunction with geosynthetic reinforcement) will be dependent on the construction traffic loading which is unknown at the time of this report. Therefore, a certain degree of trial and error may be required during construction to verify the recommended stabilization section thicknesses.

If fractured, angular cobble is selected to stabilize the subgrade, it should have a maximum particle size of eight (8) inches and should be relatively free of sand and fines (silt and clay). The first layer of cobble should be placed in an 18-inch thick loose lift and trafficked with tracked-construction and vibratory drum compaction equipment until it is observed to densify. If vibratory compaction destabilizes the subgrade, it should be discontinued. If the cobble is placed in a confined excavation, it should be mechanically densified from outside the excavation with vibratory compaction equipment.
If geosynthetic reinforcement is selected, it should consist of Tensar TX-160 or equivalent. Alternatives to Tensar TX-160 should be approved by the geotechnical engineer prior to use on site. The following recommendations are provided for subgrade stabilization using geosynthetic reinforcement.

- Geosynthetic reinforcement materials should be placed on a properly prepared subgrade with a smooth surface. Loose and disturbed soil should be removed prior to placement of geosynthetic reinforcement materials.

- A non-woven geotextile filter fabric should be placed on the properly prepared subgrade. The geosynthetic reinforcement should be placed directly on top of the filter fabric. The filter fabric and geosynthetic reinforcement should be unrolled in the primary direction of fill placement and should be over-lapped at least three (3) feet.

- The geosynthetic materials should be pulled taut to remove slack and pinned in place. If the material does not remain taut during fill placement, its effectiveness will be reduced.

- Construction equipment should not be operated directly on the geosynthetic materials. Fill should be placed from outside the excavation to create a pad on which equipment may be operated. We recommend a minimum of twelve (12) inches of structural fill be placed over the geosynthetic reinforcement before operating construction equipment on the fill. Low pressure, track-mounted equipment should be used to place fill over the geosynthetic reinforcement.

- Fill placed directly over the geosynthetic reinforcement should be properly moisture conditioned prior to placement and should meet the following gradation.

Sieve Size	Percent Passing
1 ½ inch	100
¾ inch	50 - 100
#4	25 - 50
#40	10 - 20
#100	5 - 15
#200	≤ 10

- The fill material should be properly compacted. Care should be taken with the use of vibratory compaction equipment. Vibration should be discontinued if it reduces the subgrade stability.

A representative of the ALLWEST should be on site during subgrade stabilization activities to verify our recommendations are followed and to provide additional recommendations as appropriate.

8.3 Excavation

Excavation of the on-site soil can be conducted with typical excavation equipment. We recommend excavations greater than four (4) feet deep be sloped no steeper than 1.5H:1V (horizontal to vertical). Alternatively, deeper excavations may be shored or braced in accordance with OSHA specifications and local codes. Regarding trench wall support, the site soil is considered Type C soil according to

Occupational Safety and Health Administration (OSHA) guidelines. The contractor is responsible to provide appropriate trench wall support and/or sloping.

Dewatering

We do not anticipate excavations will encounter groundwater at this site for the proposed construction.

8.4 Structural Fill, Placement, and Compaction

Structural fill is defined as soil placed or moved on a site that will support any structural element including buildings, slabs, or pavement. Structural fill typically includes the footprint area and five (5) feet beyond for structures. Non-structural fill is soil placed beyond the structural fill area. Structural fill should be free of organic matter, frozen soil and deleterious debris. Prior to placing structural fill, topsoil, organic material, uncontrolled fill and debris should be removed. The ground surface should be relatively level. Structural fill should be placed on subgrades prepared as directed in the Site Preparation section of this report. In wet weather or spring conditions, using silty or fine-grained soil for fill may delay construction and increase costs.

It is our opinion the native sand and gravel soils are suitable for reuse as structural fill provided they can be kept at or near optimum moisture content for compaction and particles larger than eight (8) inches in diameter are separated. Some of the silty sand and gravel on site contains a moderate to high fines content percentage and will require moisture conditioning (either wetting or drying) to achieve the required soils density levels.

We recommend structural fill consist of granular material meeting the particle size requirements of the Washington State Department of Transportation Standard Specifications section 9-03.14(2) for Select Borrow as shown below in the following table. ALLWEST can review alternate structural fill submittals if requested prior to construction.

Sieve Size	Percent Passing
6-inch	99-100
3-inch	75-100
No. 40	50 max.
No. 200	10.0 max.

Structural fill should be placed in lift thicknesses which are appropriate for the compaction equipment used. Typically, six (6) to eight (8) inch loose lifts are appropriate for typical rubber tire and steel drum compaction equipment. Lift thicknesses should be reduced to four (4) inches for hand operated compaction equipment. Fill should be moisture conditioned to within two (2) percentage points of the optimum moisture content prior to placement to facilitate compaction. We recommend structural fill be compacted to a minimum of 95 percent of the modified

Proctor maximum dry density up to subgrade elevation in building, parking, drive, and slab areas. The compaction efforts should result in the soil being compacted to a firm, dense, and unyielding condition (to the point where no further compression is observed following compaction efforts). We recommend ALLWEST be retained to observe the placement and compaction process to assess if sufficient compaction has been achieved.

The following recommendations are provided for placement of fill materials which cannot be tested due to the percentage of oversize particles (+3/4" diameter) being more than allowed by ASTM specifications.

- The structural fill should be placed in maximum 12 inch thick lifts with a minimum 10-ton vibratory compactor. The compactor should impart a minimum dynamic force of 30,000 pounds of impact per vibration with a minimum of 1,000 vibrations per minute. These recommendations are based on Washington State Department of Transportation Standard Specifications for placement of rock fill, WSDOT 2-03.3(14) A.

- A minimum of six (6), full coverage passes should be made for each six (6) inches of lift thickness.

- Fill materials, which cannot be tested by nuclear densometer due to the large amount of oversize particles require full time observation by a representative of ALLWEST during placement.

8.5 Wet Weather Construction

We recommend earthwork for this site be scheduled for the drier seasons of the year. If construction is undertaken in wet periods of the year, it will be important to slope the ground surface to provide drainage away from construction areas.

8.6 Cold Weather Construction

If site grading and construction are anticipated during cold weather, we recommend good winter construction practices be observed. Snow and ice should be removed from excavated and fill areas prior to additional earthwork or construction. Footings, floors slabs, or any structural portions of the construction should not be placed on frozen ground; nor should the supporting soils for buildings be permitted to freeze during or after construction. Frozen soils should not be used as backfill or fill.

8.7 Foundation Recommendations

The proposed building at the site may be supported on spread footings with on-grade floor slabs.

Spread Footing Foundation Design

- The proposed building may be supported on spread footings bearing on native sand and gravel compacted to at least 95 percent of modified Proctor maximum dry density and/or structural fill compacted to at least 95 percent of the modified Proctor maximum dry density placed above the native sand and gravel.

- Spread footings may be designed for a net allowable bearing pressure of 3,000 pounds per square foot (psf). The allowable bearing pressure value may be increased by one-third to account for transient loads such as wind and seismic.

- Footings should be embedded at least 24 inches below the lowest adjacent grade or to local jurisdiction required depth for frost protection.

- If the previous recommendations are implemented, it is our opinion total settlement will be one (1) inch or less and differential settlement will be approximately ½ inch.

- A coefficient of friction of 0.45 may be used for sliding resistance between concrete footings and structural fill. For mass concrete placed on a vapor retarder we recommend using a coefficient of friction against sliding of 0.35.

- The ground surface around foundations should be sloped away from foundations at a minimum grade of five (5) percent in the first ten (10) feet. The slope may be reduced to two (2) percent if impermeable ground covering, such as pavement, is placed adjacent to the foundations.

- We recommend backfill placed adjacent to foundation walls be compacted to a minimum of 92 percent of the modified Proctor maximum dry density as established by ASTM D 1557. Backfill should be placed in uniform lifts on both sides of the foundation walls to reduce displacement of the foundation walls.

8.8 Concrete On-Grade Slabs

We recommend placing a minimum of six (6) inches of crushed aggregate base immediately below slabs. Base should be compacted as recommended in the Fill Placement and Compaction section (Section 8.4) of this report. We recommend specifying crushed gravel top or base course meeting the requirements of the Washington Department of Transportation (WSDOT) Standard Specification 9-03.9(3) for crushed gravel top or base course. We are available to review alternate under-slab structural fill materials if requested.

We recommend consideration be given to including a moisture vapor retarder beneath concrete on-grade floor slabs to retard moisture migration through the slabs if moisture sensitive floor coverings are planned. We recommend the moisture retarder be installed per American Concrete Institute (ACI) recommendations and specifications. To reduce the potential for moisture migration through the slabs, it is important to include the moisture vapor retarder as well as direct surface and subsurface water away from the slabs. In addition, concrete should be given adequate time to cure prior to placing impermeable flooring.

8.9 Lateral Earth Pressures

We understand below grade walls, such as loading dock walls and basements, are not planned for the project.

8.10 Seismicity

We anticipate the 2012 International Building Code (IBC) will be used as the basis for design of the proposed structures. Based on information provided in the IBC, the soil at the site can be characterized as Site Class C for seismic design. The following seismic parameters were calculated using Earthquake Ground Motion Parameters software, version 5.0.6 (USGS, June 29, 2006) for use with the 2006, 2009, and 2012 IBC. The latitude and longitude for the site were used to establish the location of the subject property.

Latitude: 47.668° N Longitude: 117.112° W

The following maximum earthquake spectral response accelerations should be used for design:

Short Period Response (S_S) – 0.343g
One Second Response (S_1) – 0.115g

The Site Class C site coefficients are:

F_a – 1.200 F_v – 1.685

8.11 Stormwater and Drainage

We understand stormwater runoff will be directed to grassed swales and drywells. Based on the results of our field and laboratory testing, it is our opinion this approach will be feasible. The soils at depth in the test pits consisted of poorly to well graded gravel. We obtained soil samples from test pit TP-4 for sieve analysis to evaluate the percent passing a No. 200 sieve.

Based on the results of the laboratory test performed on samples collected from test pit TP-4, a permeability and outflow rate for the poorly to well graded gravel encountered at depth in the test pits throughout the site were estimated using the Spokane 200 Method from the Spokane Regional Stormwater Manual (SRSM). The estimated permeability and outflow rates are shown in the following table.

Recommended Drywell Design Outflow Rates

Test Pit No.	Depth (ft)	Percent Fines	Estimated Permeability Rate (cm/s)	Normalized Outflow Rate (cfs/ft)	Actual Drywell Outflow Rate (cfs)		Design Drywell Outflow Rate (cfs)	
					Type "A"	Type "B"	Type "A"	Type "B"
TP-1	4 - 15	3.2	7.2×10^{-2}	0.16	1.0	1.6	0.3	1.0

Our recommended drywell design outflow rates include a minimum safety factor of 1.3 as recommended by the SRSM. The maximum design drywell outflow rates allowed by Spokane County guidelines are 0.3 cfs for Type A (single depth) drywells and 1.0 cfs for Type B (double depth) drywells.

We recommend the site be graded such that storm run-off water is directed away from the building and pavement areas to a stormwater drainage system. We recommend landscape areas be sloped a minimum of six (6) inches within ten (10) feet of the building and slabs be sloped a minimum of two (2) percent. In addition, we recommend gutters and downspouts with long splash blocks or extensions. We do not recommend directing stormwater into a foundation drain system.

8.12 Pavement

After removing the topsoil and preparing the subgrade, we anticipate the subgrade will consist of native sand, gravel, or structural fill. It is our opinion the native sand and gravel soils or structural fill will provide an adequate pavement section subgrade provided the subgrade is prepared as recommended in the Site Preparation section (Section 8.1) of this report. It is important the subgrade surface be shaped to provide for positive drainage to reduce the potential for water to pond in the subgrade.

Prior to placing the aggregate base, we recommend all subgrade areas be compacted to at least 95 percent of the modified Proctor maximum dry density (ASTM D 1557). In addition, the subgrade area should be proof-rolled with a loaded dump truck. This measure would assist in detecting localized soft areas. Soft areas discovered during the proof-rolling operation should be excavated and replaced with a suitable structural fill material. We recommend the proof-rolling process be observed by a geotechnical engineer to make the final evaluation of the subgrade.

We recommend a pavement section consisting of a minimum of two (2) inches of hot mix asphalt pavement over six (6) inches of crushed gravel base for the automobile parking and drive areas. If heavy traffic or frequent traffic is planned, we should be notified so we can reevaluate our recommended pavement section and provide additional recommendations if needed.

We recommend specifying crushed gravel top or base course meeting the requirements of the Washington Department of Transportation (WSDOT) Standard Specification 9-03.9(3) for crushed gravel top or base course. We recommend the asphalt concrete pavement meet the requirements of WSDOT Standard Specification for Hot Mix Asphalt (HMA) Class ½ inch asphalt concrete pavements. We recommend the crushed gravel base be compacted to a minimum of 95 percent of its modified Proctor maximum dry density (ASTM D 1557). We recommend the asphaltic concrete surface be compacted to a minimum of 91 percent of the Rice density. If a high percentage of truck traffic is expected, we should be notified so we can review our pavement recommendations and provide revisions if necessary.

9.0 ADDITIONAL RECOMMENDED SERVICES

We recommend ALLWEST Testing & Engineering, LLC be retained to provide construction observation and materials testing to verify the soil and geologic conditions and the report recommendations are incorporated into the actual construction. In-place testing should be performed by an experienced engineering technician at the time of construction to verify the recommended levels of compaction are achieved. If we are not retained to provide the recommended plan review and construction observation services, we cannot be responsible for soil engineering related construction errors or omissions.

10.0 EVALUATION LIMITATIONS

This report has been prepared to assist the planning and design of the proposed Country Vista Drive Commercial Building to be located at 21801 East Country Vista Drive in Liberty Lake, Washington. Our services consist of professional opinions and conclusions made in accordance with generally accepted geotechnical engineering principles and practices in our local area at the time this report was prepared. This acknowledgement is in lieu of all warranties either expressed or implied.

The following plates complete this report:

Appendix A – Site Location Map, NRCS Soil Map, Test Pit Location Map
Appendix B – Logs of Test Pits, Unified Soil Classification System
Appendix C – Laboratory Test Results

11.0 PROFESSIONAL ACKNOWLEDGEMENT

This report was prepared by me or under my direct supervision and I am a duly registered engineer under the laws of the State of Washington.

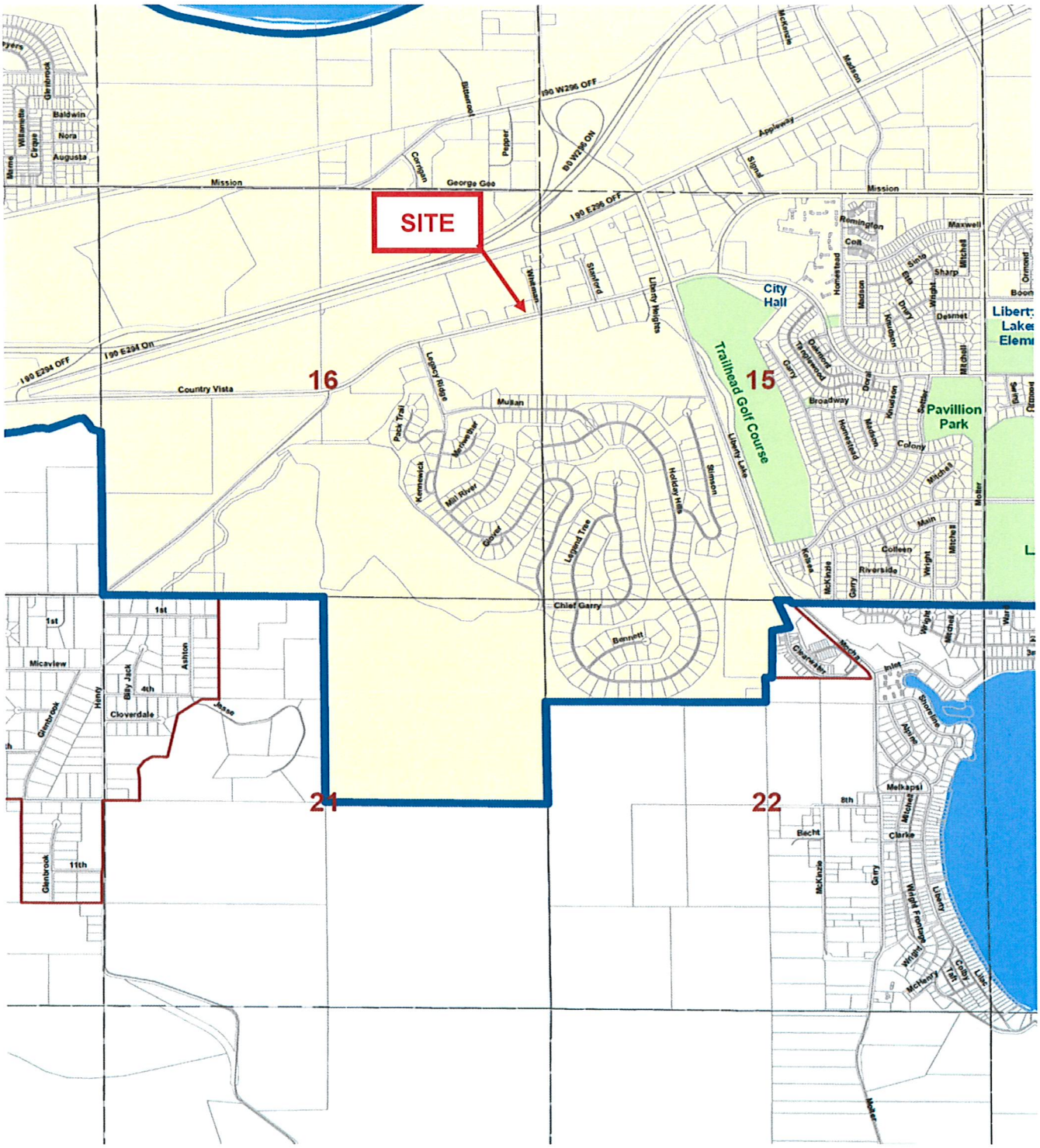
Andy Eliason

Andy J. Eliason, P.E.
Spokane Area Manager

8/31/16

APPENDIX A
SITE LOCATION MAP, NRCS MAP, TEST PIT LOCATION MAP

ALLWEST
Testing & Engineering



ALLWEST Testing & Engineering

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FIGURE 1—SITE LOCATION MAP

LIMITED GEOTECHNICAL EVALUATION

COUNTY VISTA DRIVE COMMERCIAL BUILDING

21801 EAST COUNTY VISTA DRIVE LIBERTY LAKE, WASHINGTON

Client Name KUNPENG, LLC.

Project No. 216-266G

Date AUGUST 31, 2016

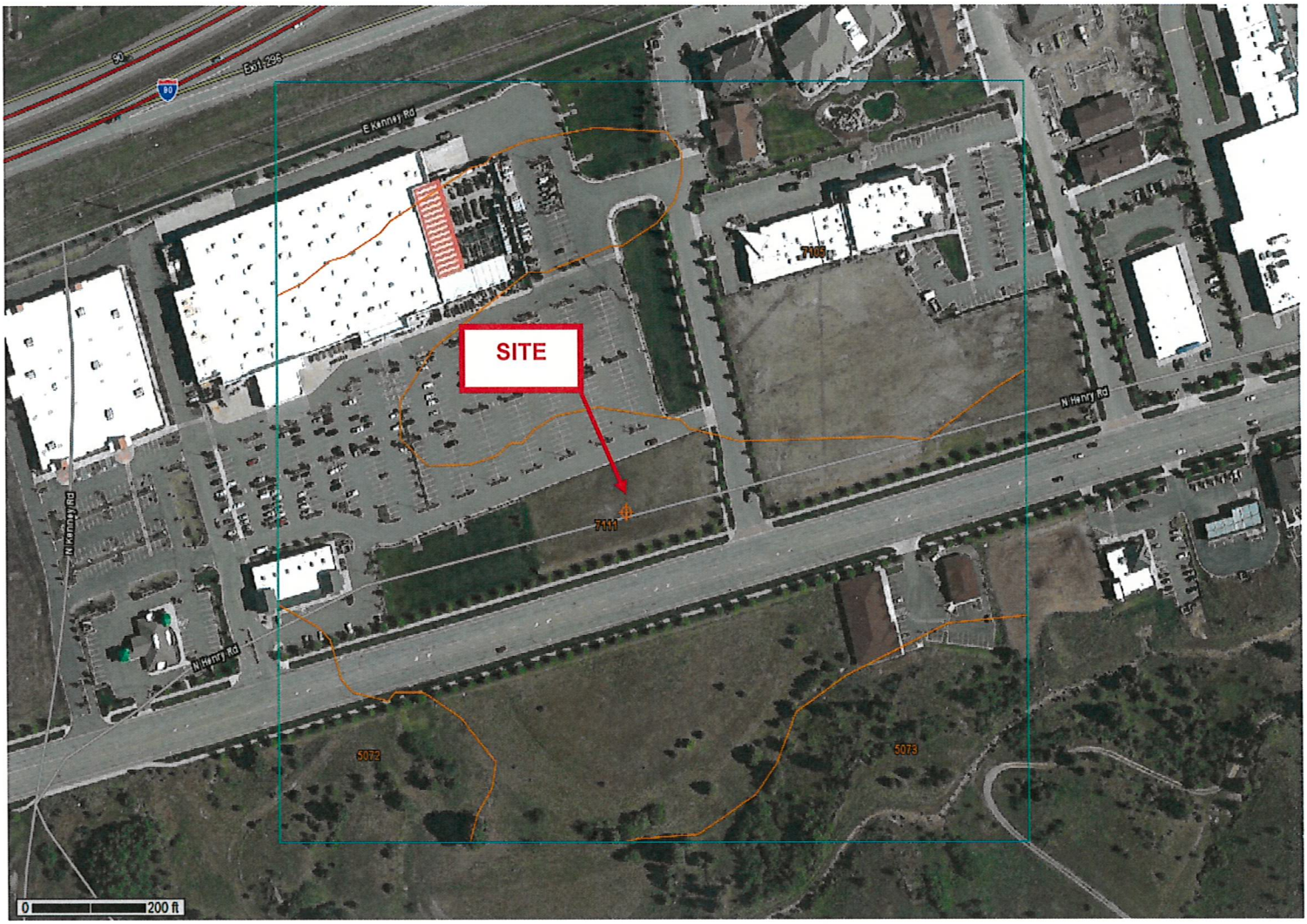

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FIGURE 2—NRCS SOIL MAP

LIMITED GEOTECHNICAL EVALUATION

COUNTRY VISTA DRIVE COMMERCIAL BUILDING

21801 EAST COUNTY VISTA DRIVE LIBERTY LAKE, WASHINGTON

Client Name KUNPENG, LLC

Project No. 216-266G

Date AUGUST 31, 2016

N

TP-X = Test Pit Number and Location

ALLWEST Testing & Engineering

3005 North Industrial Lane, 5th Street
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FIGURE 3—TEST PIT LOCATION MAP

LIMITED GEOTECHNICAL EVALUATION

COUNTRY VISTA DRIVE COMMERCIAL BUILDING

21801 EAST COUNTRY VISTA DRIVE, LIBERTY LAKE, WASHINGTON

Client Name KUNPENG, LLC.

Project No. 216-266G

Date AUGUST 31, 2016

APPENDIX B
TEST PIT LOGS,
UNIFIED SOIL CLASSIFICATION SYSTEM

ALLWEST
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LOG OF TEST PIT

ALLWEST Testing & Engineering

PROJECT:	TEST PIT: TP-1	
Limited Geotechnical Evaluation **Country Vista Drive Commercial Building** **21801 East Country Vista Drive** **Liberty Lake, Washington** **Project No. 216-266G**	LOCATION: **See Test Pit Location Map - Figure A.3.**	
	DATE: **6/30/2016**	SCALE: **1" = 2.5'**

Depth	ASTM D2487 Symbol	Description of Materials	WL	Tests or Notes
0.0				
0.5	SM	SILTY SAND WITH GRAVEL, medium grained, brown, with organics, moist. (Topsoil)		
1.5	GM	SILTY GRAVEL WITH SAND, coarse grained, brown, moist. (Alluvium)		
	GP	POORLY GRADED GRAVEL WITH SAND AND COBBLES, coarse grained, gray, moist. (Alluvium)		
15.0		End of test pit. Groundwater not encountered at time of excavation. Test pit immediately backfilled.		

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF TEST PIT

ALLWEST Testing & Engineering

PROJECT: **Limited Geotechnical Evaluation** **Country Vista Drive Commercial Building** **21801 East Country Vista Drive** **Liberty Lake, Washington** **Project No. 216-266G**	TEST PIT: **TP-2** LOCATION: **See Test Pit Location Map - Figure A.3.** DATE: **6/30/2016** SCALE: **1" = 2.5'**

Depth	ASTM D2487 Symbol	Description of Materials	WL	Tests or Notes
0.0				
1.0	SM	SILTY SAND WITH GRAVEL, medium grained, brown, with organics, moist. (Topsoil)		
4.0	SM	SILTY SAND WITH GRAVEL, coarse grained, brown, moist. (Alluvium)		
15.0	GP	POORLY GRADED GRAVEL WITH SAND AND COBBLES, coarse grained, gray, moist. (Alluvium)		
		End of test pit. Groundwater not encountered at time of excavation. Test pit immediately backfilled.		

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF TEST PIT

ALLWEST Testing & Engineering

PROJECT: **Limited Geotechnical Evaluation** **Country Vista Drive Commercial Building** **21801 East Country Vista Drive** **Liberty Lake, Washington** **Project No. 216-266G**	TEST PIT: **TP-3** LOCATION: **See Test Pit Location Map - Figure A.3.** DATE: **6/30/2016** SCALE: **1" = 2.5'**

Depth	ASTM D2487 Symbol	Description of Materials	WL	Tests or Notes
0.0				
1.0	SM	SILTY SAND WITH GRAVEL, medium grained, brown, with organics, moist. (Topsoil)		
2.0	GP-GM	POORLY GRADED GRAVEL WITH SILT AND SAND, coarse grained, brown, moist. (Alluvium)		
	GP	POORLY GRADED GRAVEL WITH SAND AND COBBLES, coarse grained, gray, moist. (Alluvium)		
15.0		End of test pit. Groundwater not encountered at time of excavation. Test pit immediately backfilled.		

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF TEST PIT

ALLWEST Testing & Engineering

PROJECT:	TEST PIT: TP-4	
Limited Geotechnical Evaluation **Country Vista Drive Commercial Building** **21801 East Country Vista Drive** **Liberty Lake, Washington**	LOCATION: **See Test Pit Location Map - Figure A.3.**	
Project No. 216-266G	DATE: **6/30/2016**	SCALE: **1" = 2.5'**

Depth	ASTM D2487 Symbol	Description of Materials	WL	Tests or Notes
0.0				
0.5	SM	SILTY SAND WITH GRAVEL, medium grained, brown, with organics, moist. (Topsoil)		
1.5	SM	SILTY SAND WITH GRAVEL, coarse grained, brown, moist. (Alluvium)		
	GW	WELL GRADED GRAVEL WITH SAND AND COBBLES, coarse grained, gray, moist. (Alluvium)		
15.0		End of test pit. Groundwater not encountered at time of excavation. Test pit immediately backfilled.		

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF TEST PIT

ALLWEST Testing & Engineering

PROJECT: **Limited Geotechnical Evaluation** **Country Vista Drive Commercial Building** **21801 East Country Vista Drive** **Liberty Lake, Washington** **Project No. 216-266G**	TEST PIT: **TP-5** LOCATION: **See Test Pit Location Map - Figure A.3.** DATE: **6/30/2016** SCALE: **1" = 2.5'**

Depth	ASTM D2487 Symbol	Description of Materials	WL	Tests or Notes
0.0				
1.0	SM	SILTY SAND WITH GRAVEL, medium grained, brown, with organics, moist. (Topsoil)		
3.5	SM	SILTY SAND WITH GRAVEL, coarse grained, brown, moist. (Alluvium)		
15.0	GP	POORLY GRADED GRAVEL WITH SAND AND COBBLES, coarse grained, gray, moist. (Alluvium)		
		End of test pit. Groundwater not encountered at time of excavation. Test pit immediately backfilled.		

(See Report and Standard Plates for elevation and descriptive terminology.)

Unified Soil Classification System

MAJOR DIVISIONS			SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS	GRAVELS	CLEAN GRAVELS	GW	Well-Graded Gravel, Gravel-Sand Mixtures.
			GP	Poorly-Graded Gravel, Gravel-Sand Mixtures.
		GRAVELS WITH FINES	GM	Silty Gravel, Gravel-Sand-Silt Mixtures.
			GC	Clayey Gravel, Gravel-Sand-Clay Mixtures.
	SANDS	CLEAN SANDS	SW	Well-Graded Sand, Gravelly Sand.
			SP	Poorly-Graded Sand, Gravelly Sand.
		SANDS WITH FINES	SM	Silty Sand, Sand-Silt Mixtures.
			SC	Clayey Sand, Sand-Clay Mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50%		ML	Inorganic Silt, Silty or Clayey Fine Sand.
			CL	Inorganic Clay of Low to Medium Plasticity, Sandy or Silty Clay.
			OL	Organic Silt and Clay of Low Plasticity.
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	Inorganic Silt, Elastic Silt, Micaceous Silt, Fine Sand or Silt.
			CH	Inorganic Clay of High Plasticity, Fat Clay.
			OH	Organic Clay of Medium to High Plasticity.
Highly Organic Soils			PT	Peat, Muck and Other Highly Organic Soils.

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APPENDIX C
LABORATORY TEST RESULTS

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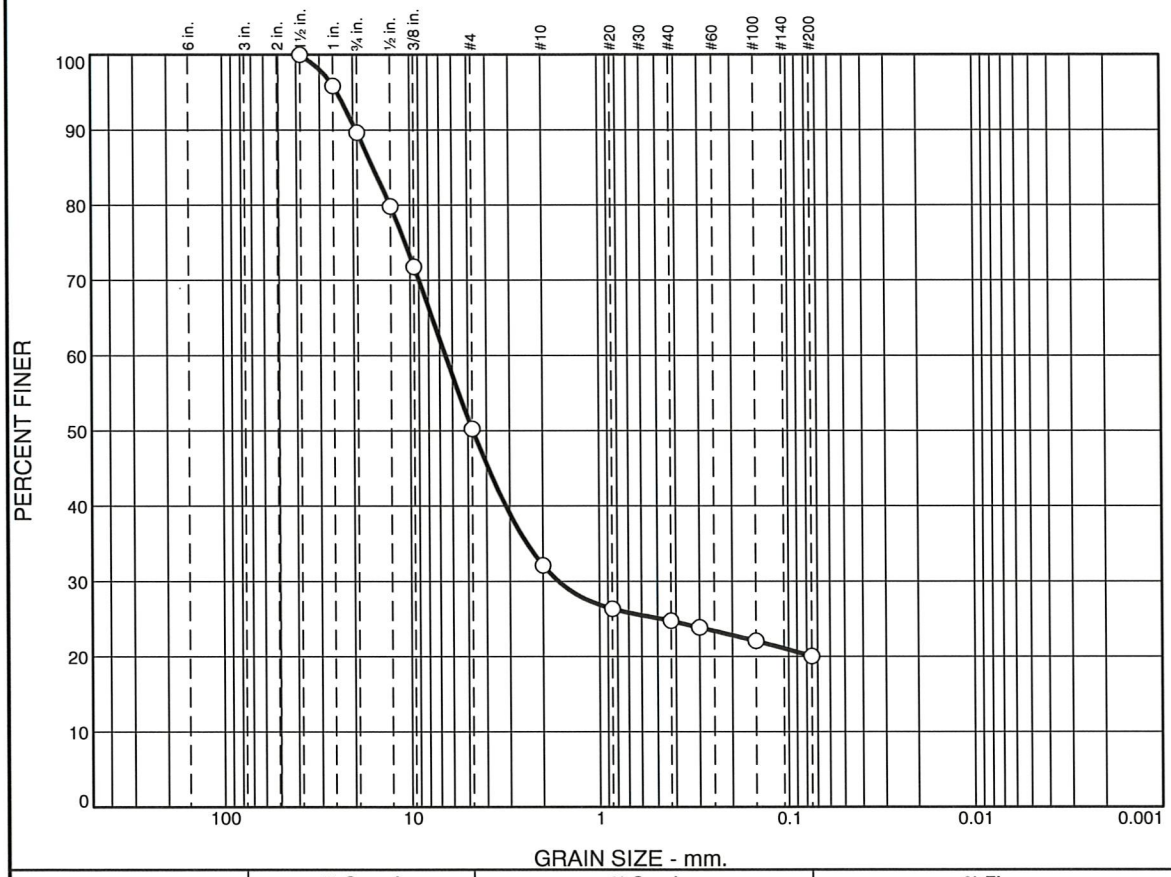
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	10	40	18	7	5	20	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100		
1"	96		
3/4"	90		
1/2"	80		
3/8"	72		
#4	50		
#10	32		
#20	26		
#40	25		
#50	24		
#100	22		
#200	20		

* (no specification provided)

Soil Description

Silty Gravel with Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 19.3500 D_{85}= 15.6530 D_{60}= 6.5351
D_{50}= 4.7051 D_{30}= 1.6561 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Sampled by C. Warrick on 6/30/16

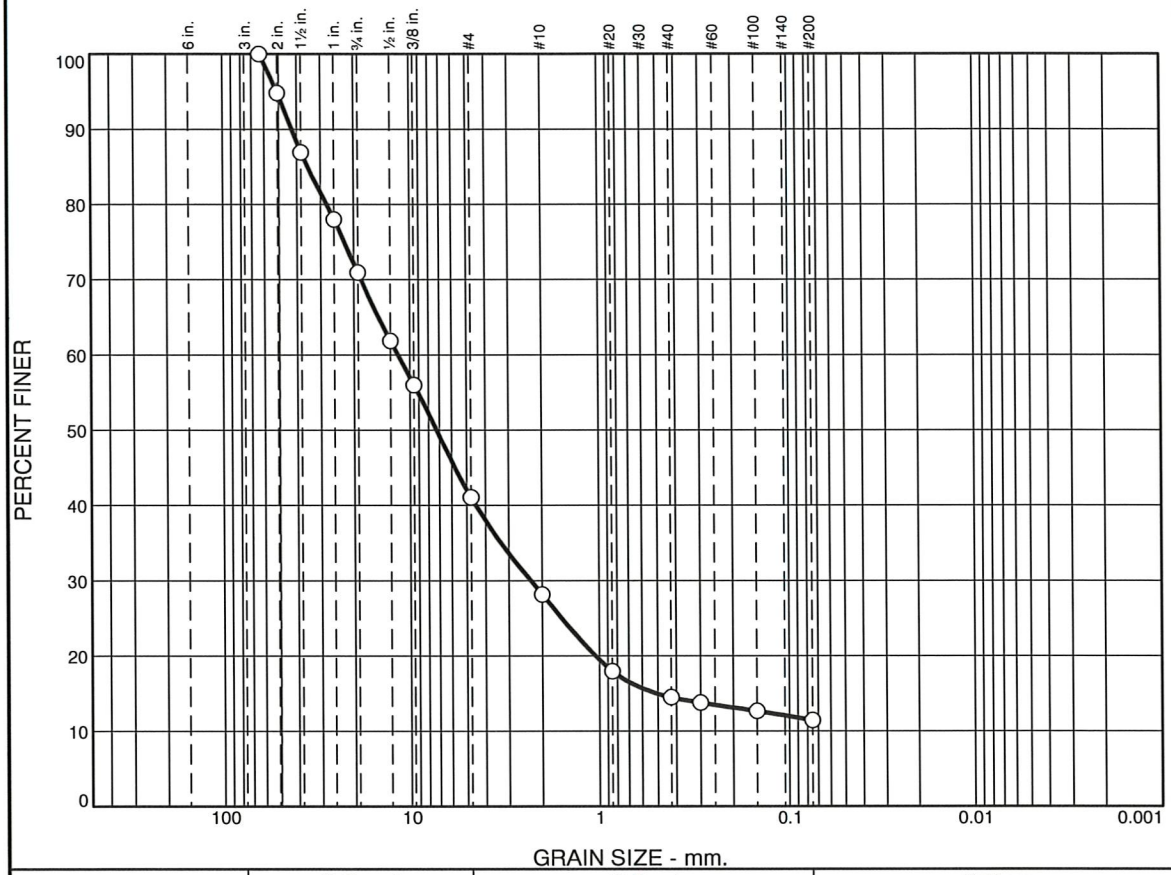
Location: TP-1
Sample Number: S216-285 **Depth:** 0.5 - 1.5 **Date:** 7/5/16

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Kunpeng, LLC
Project: County Vista Drive Commercial Building
Project No: 216-226G **Reviewed By:** AE

Tested By: F.D. **Checked By:** C. Warrick

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	29	30	13	14	3	11	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 1/2"	100		
2"	95		
1 1/2"	87		
1"	78		
3/4"	71		
1/2"	62		
3/8"	56		
#4	41		
#10	28		
#20	18		
#40	14		
#50	14		
#100	13		
#200	11		

* (no specification provided)

Soil Description

Poorly graded gravel with silt and sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 42.6427 D_{85}= 35.1481 D_{60}= 11.5819
D_{50}= 7.2367 D_{30}= 2.2987 D_{15}= 0.5048
D_{10}= C_u= C_c=

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

Sampled by C. Warrick on 6/60/16

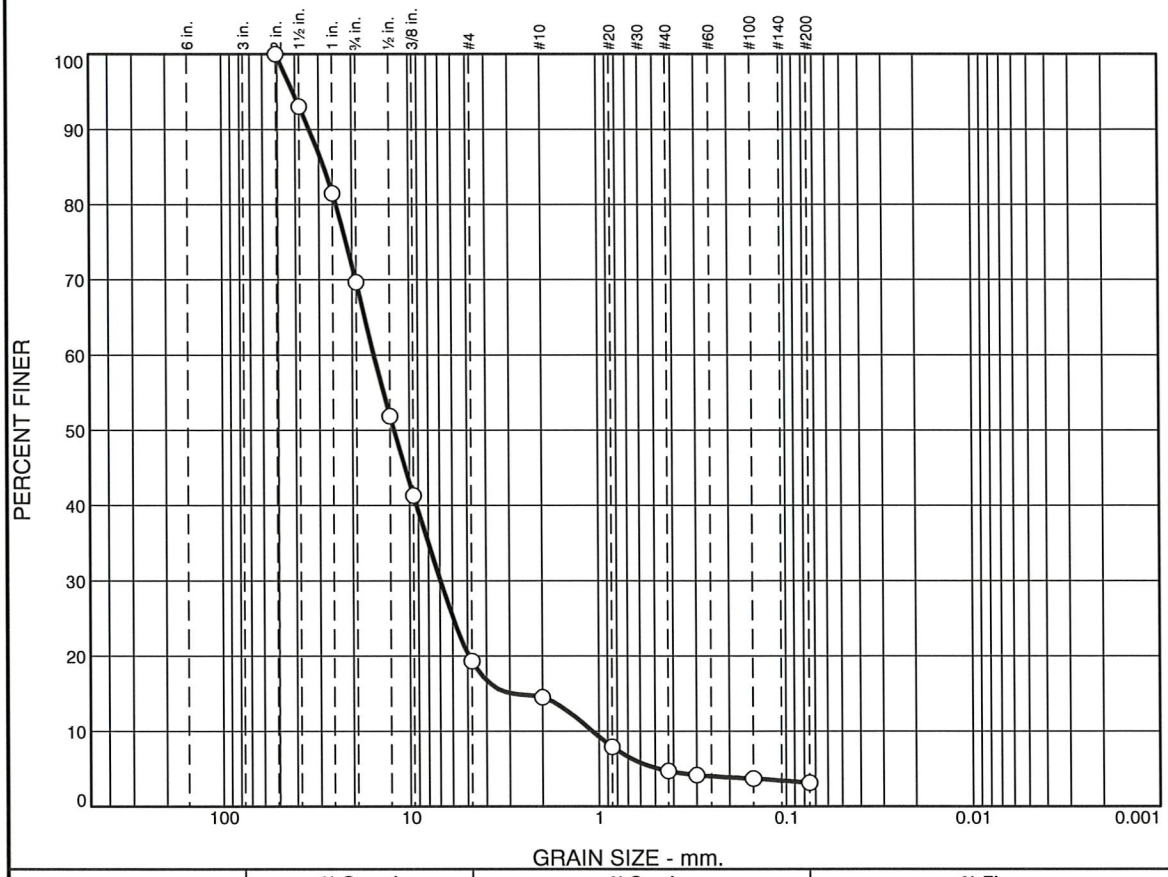
Location: TP-3
Sample Number: S216-284 **Depth:** 1.0 - 2.0 **Date:** 7/5/16

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Kunpeng, LLC
Project: County Vista Drive Commercial Building
Project No: 216-226G **Reviewed By:** AE

Tested By: F.D. **Checked By:** C. Warrick

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	30	51	5	9	2	3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1 1/2"	93		
1"	81		
3/4"	70		
1/2"	52		
3/8"	41		
#4	19		
#10	14		
#20	8		
#40	5		
#50	4		
#100	4		
#200	3.2		

* (no specification provided)

Soil Description

Well graded Gravel with Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 33.7324 D_{85}= 28.2487 D_{60}= 15.3724
D_{50}= 12.1041 D_{30}= 6.9479 D_{15}= 2.8529
D_{10}= 1.0823 C_u= 14.20 C_c= 2.90

Classification

USCS= GW AASHTO= A-1-a

Remarks

Sampled by C. Warrick on 6/30/16

Location: TP-4
Sample Number: S216-283 **Depth:** 1.5 - 15.0 **Date:** 7/5/16

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Kunpeng, LLC
Project: County Vista Drive Commercial Building
Project No: 216-226G **Reviewed By:** AE

Tested By: F.D. **Checked By:** C, Warrick